Claims

1. An antibody that specifically binds to an ePAD polypeptide.

2. The antibody of claim 1 wherein the antibody specifically binds to the polypeptide of SEQ ID NO: 1.

3. The antibody of claim 1 wherein said antibody is a monoclonal antibody.

4. A composition comprising the antibody of claim 1 and a pharmaceutically acceptable carrier.

5. A method for identifying antagonists of ePAD activity, said method comprising

contacting an ePAD protein with a methylated peptide substrate and a potential ePAD antagonist, to form an assay composition;

incubating the assay composition, under conditions permissive for ePAD demethylase activity in the absence of an ePAD inhibitor; and

identifying antagonists of ePAD activity based on the ability of said potential ePAD antagonist to decrease the demethylase activity of ePAD.

6. The method of claim 5 wherein the antagonist activity is detected through the use of an antibody that specifically binds to either the demethylated peptide substrate or the methylated substrate.

7. The method of claim 5 wherein a control assay composition is prepared comprising the ePAD protein and methylated substrate but lacking the potential ePAD antagonist, and wherein said identifying step comprises determining the relative amounts of methylated substrate present in the assay composition compared to the control assay composition after said incubation step, wherein the existence of a higher amount of methylated substrate in the assay composition relative to the control assay composition identifies an antagonist of ePAD.

8. The method of claim 5 wherein the ePAD protein comprises an amino acid sequence of SEQ ID NO: 1.

9. The method of claim 8 wherein the methylated peptide substrate comprises an amino acid sequence of SEQ ID NO: 6.

10. A method of decreasing the fertility of a female mammalian species, said method comprising the steps of administering a composition comprising an inhibitor of ePAD activity.

11. The method of claim 10 wherein the administered composition comprises an antibody that specifically binds to ePAD.

12. The method of claim 10 wherin the administered composition comprises an amino acid sequence of SEQ ID NO: 1, or a fragment thereof.

13. The method of claim 10 wherein the administered composition comprises an antibody that specifically binds to the polypeptide of SEQ ID NO: 1.

14. A recombinant human ePAD gene construct, said construct comprising a non-native promoter operably linked to the nucleic acid sequence of SEQ ID NO: 2.

15. A transgenic cell comprising the construct of claim 14.

16. A method of screening for potential human therapeutic agents, said method comprising contacting a human ePAD polypeptide comprising the amino acid sequence of SEQ ID NO: 1 with a candidate compound under physiological conditions;

washing the human ePAD polypeptide to remove unbound and non-specific bound material; and

isolating compounds that remain bound to the human ePAD polypeptide.

17. The method of claim 16 wherein the human ePAD polypeptide is immobilized on a solid surface and the candidate is labeled.

18. The method of claim 17 further comprising the step of determining if the candidate compound selectively binds to said ePAD polypeptide relative to other PAD polypeptides.

19. An antigenic composition comprising an amino acid sequence comprising SEQ ID NO: 1 or an antigenic fragment thereof and a pharmaceutically acceptable carrier.

20. The composition of claim 19 further comprising an adjuvant.

21. The composition of claim 20 wherein the antigenic fragment consists of SEQ ID NO: 5 or a fragment thereof.